Article

Factors associated with the career path choices of veterinarians in western Canada

Murray D. Jelinski, John R. Campbell, Jonathan M. Naylor, Karen L. Lawson, Dena Derkzen

Abstract — This second of 2 articles, relating to the veterinary profession in western Canada, explores the factors associated with veterinarians' career path choices. Among other factors, companion animal (small animal and equine) (CA) practitioners were less likely to have been raised in, or near to, a small center (≤ 10 000), were more concerned with their workload (hours of work and number of nights on-call), and preferred to work in progressive practices. Food animal (FA) practitioners were more likely to be male, have been raised in a small center, have been raised in the Province of Saskatchewan, and to have self-assessed themselves as having an above average knowledge of agriculture at the time they applied for admission to veterinary college. Mixed animal (MA) practitioners had more factors in common with FA than with CA practitioners. Three main factors were associated with leaving mixed or food animal practice: hours of work and too many nights on-call, the level of remuneration, and lack of support and mentorship.

Résumé — Étude des facteurs associés aux choix de carrière des vétérinaires dans l'Ouest canadien. Le deuxième de deux articles portant sur la profession vétérinaire dans l'Ouest canadien explore les facteurs associés aux choix de carrière des vétérinaires. Entre autres facteurs, il était moins probable que les praticiens pour animaux de compagnie (petits animaux et équins) aient grandi dans une petite ville ou à proximité (≤ 10 000), les praticiens étaient plus préoccupés par leur charge de travail (heures de travail et nombre de soirées de garde) et privilégiaient le travail dans les pratiques progressistes. Il était plus probable que les praticiens pour animaux destinés à l'alimentation étaient des hommes, qu'ils avaient été élevés dans une petite ville, qu'ils avaient grandi dans la province de la Saskatchewan et qu'ils s'étaient auto-évalués comme ayant une connaissance supérieure à la moyenne de l'agriculture au moment où ils avaient présenté leur demande d'admission à l'école de médecine vétérinaire. Les praticiens en pratique mixte avaient plus de facteurs en commun avec les praticiens pour animaux destinés à l'alimentation qu'avec les praticiens pour animaux de compagnie. Trois principaux facteurs étaient associés à l'abandon de la pratique mixte ou de la pratique des animaux destinés à l'alimentation : les heures de travail et des nuits de garde trop nombreuses, le taux de rémunération et l'absence de soutien et de mentorat.

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Introduction

Concerns regarding shortages of food animal- (FA)-oriented practitioners are certainly not new to the Canadian veterinary profession. In 1965, Kingrey (1), writing on the apparent lack of interest among graduates in entering into FA practice, stated, *"At present schools are reporting that there are not enough new graduates interested in large animal practice to meet the demand"* and *"…that an increasing percentage of applicants are urban students who have no plans to enter general or large animal practice."* In commenting on the future of FA practice in

Department of Large Animal Clinical Sciences, Western College of Veterinary Medicine (Jelinski, Campbell); Department of Psychology (Lawson, Derkzen), University of Saskatchewan, Saskatoon, Saskatchewan S7N 5B4; Department of Clinical Sciences, Ross University, School of Veterinary Medicine, Basseterre, St. Kitts, West Indies (Naylor).

Address all correspondence to Dr. Murray Jelinski; e-mail: murray.jelinski@usask.ca

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Alberta, O'Donoghue (2) wrote, in 1967, *"A smaller percentage of graduates will enter large animal practice. There may be difficulty in filling the need as established generations retire and younger people choose the better hours of salaried positions or the challenges presented by the many scientific fields opening to them."* In 1989, Carswell (3), noting that the lack of food animal veterinarians may be more related to retention than recruitment, stated *"…the number of veterinarians leaving food animal practice is a more significant symptom of the problem than the scarcity of graduates willing to enter that field."* This observation was supported by a study conducted around that same period that showed that < 50% of those who opted for large animal practice at the time of graduation had remained in this field, with most leaving soon after graduation (4). More recently, Guichon et al (5) expressed their concerns that *"…animal agriculture is not being well served by veterinary medicine because of a declining student interest and inadequate numbers of highly qualified veterinarians in all aspects of food animal veterinary medicine."*

The 2nd report in a two-part series addresses the 2nd objective of a study examining the careers of veterinarians in western Canada, namely, to identify the factors associated with choosing a career in companion animal (CA), mixed animal (MA), and predominantly FA practice. Special attention is given to the factors associated with veterinarians leaving MA and FA practice within 5 y of graduation.

Materials and methods

A random sampling of 551 veterinarians, employed in the 4 western provinces of Canada, were surveyed from June to September 2006 to determine the factors associated with veterinary career path (employment) choices. Details of the survey design, the randomized selection procedure, the administration of the survey, and the format and content of the survey questionnaire have been described previously (6). The survey questionnaire can be viewed in its entirety on-line (7).

Central to interpreting the data is the need to recognize how the practitioners were classified by practice type (CA, MA, and FA). In the 1st instance, practitioners were asked to state how much time they devoted to each species; these data were then used to categorize the respondents by practice type. In the 2nd instance, practitioners self-classified themselves as to practice type. This classification scheme was used to assess how the respondents' level of interest in each type of veterinary practice had evolved from the time of their preveterinary program to the time of the survey. The self-classification scheme was also used to identify the "switchers" (SW), those who had left MA or FA practice within 5 y of graduation.

Classification and analysis of the CA, MA, and FA practitioners

Practitioners were asked to estimate the amount (%) of time they devoted to each of the following: small animals, beef cattle, dairy cattle, horses, swine, poultry, and "other." This information was requested for every time they changed employers or employment status (went from being an employee to an owner or vice versa within the same practice). Veterinarians involved exclusively (100%) in small animal and/or equine practice were classified as CA practitioners; veterinarians who spent 1% to 50% of their time on food animals were categorized as MA practitioners; and veterinarians who spent > 50% of their time on food animals (beef cattle, dairy cattle, swine, and poultry) were classified as predominantly FA practitioners. The CA, MA, and FA acronyms refer specifically to the private practitioners categorized by the above system, they are not used when referring to the practitioners who self-identified themselves by practice type.

Logistic regression models were then used to determine the factors associated with those who were currently in CA, MA, or FA practice. For each model, the dependent variable (CA, MA, FA) was compared against all other private practitioners (referent). A backwards (likelihood ratio) logistic regression model was used for each analysis, and the variables entered and exited the models at $P < 0.05$ and $P > 0.10$, respectively. A statistical software package (SPSS Version 14; Chicago, Illinois, USA; Statistix, Version 8.1; Tallahasee, Florida, USA) was used for these analyses. Statistical significance was considered to be $P < 0.05$.

Self-classification of practitioners by practice type

A self-classification scheme was used to determine which type of practice the respondents were most interested in pursuing at each of the following time points: during their preveterinary program, at the time of their graduation from veterinary school, 2 y postgraduation, and the time of the survey (current position). The options provided for each time point were as follows: small animal, mixed animal, food animal, equine, "other," and "can't recall/not sure." No definitions were provided as to what constituted each type of practice.

In addition to the CA, MA, and FA logistic regression models, a 4th model was developed for those who had left MA or FA practice (the "switchers"). Respondents were classified as switchers (SW), or nonswitchers, according to how they answered the following question: *"Does the following scenario apply to you? Upon graduation you chose a career in mixed or food animal practice but within 5 years you were no longer involved in this type of practice?"* A backwards logistic regression model compared the SW to those practitioners who had remained in MA or FA practice, ignoring those who had never entered these types of practice. This model differs from the other models in that the respondents' used their own judgement as to whether they had left MA or FA practice within 5 y of graduation.

All the practitioners were asked to rank 14 factors as to how influential each factor had been in their choice of a career path (choosing a place of employment); however, the SW were also asked to rank 12 statements/factors, on a scale of 1 to 5, as to how much each factor had influenced their decision to leave MA or FA practice. The factors were then sorted by the combined number of *"Important"* and *"Very important"* rankings, or scores of "4" or "5," respectively.

Variables used in the logistic regression models

Table 1 provides a list of the 26 variables offered to each of the 4 models (CA, MA, FA, and SW), 7 of which were dichotomous: gender (male/female); had a rural (farm/acreage) or

Table 1. List of the 26 variables that were offered to the 4 logistic regression models

Dichotomous variables
- — Gender
- — Rural (farm/acreage) versus urban (city/town) upbringing
- — Raised in, or nearby, a small (≤ 10 000) or large center (> 10 000)
- — Raised in Saskatchewan versus all other provinces
- — Involved in 4-H (an organization that fosters awareness of agriculture) when growing up
- — Educated at the Western College of Veterinary Medicine or elsewhere
- — Had a family member/friend who was a veterinarian

Continuous variables
- — Age (years) at time the respondent decided to become a veterinarian
- — Current age (years)

Variables that used a 4-point Likert scale
- — Knowledge of agriculture at time of applying to veterinary school
  1 = poor 2 = average 3 = good 4 = excellent
- — Career was guided by "personal gain\reward" or "societal influences"
  1 = "all personal" 2 3 4 = "all societal influences"
- — Philosophical statement that best describes lifestyle and career
  1 = "I work to live" 2 3 4 = "I live to work"

The following question used a 5-point Likert scale:
Score the following factors in regards to how they have influenced your career path, with "1" being "not at all important" and "5" being "very important:"
- — Overall aesthetic appeal of the practice and location
- — Geographical location of the practice
- — Proximity to recreational activities
- — Progressiveness of the practice
- — Wage and fringe benefits
- — Hours of work and number of nights on-call
- — Level of support/mentorship from owner/colleagues
- — Level of responsibilities and type of caseload
- — Size of city/town where clinic is located
- — Type of practice
- — Established relationship with veterinarian(s) at the practice
- — Number of veterinarians in the practice
- — Need to be close to family and/or friends
- — Spousal and family considerations

urban (town/city) upbringing; involved in 4-H when they were growing up; raised in, or near to, a small (≤ 10 000) or large (> 10 000) center; raised in the province of Saskatchewan or elsewhere; a graduate of the Western College of Veterinary Medicine (WCVM) or another college; and whether they had a family member or friend who was a veterinarian.

The following 3 variables (questions) used a 4-point Likert scale: 1) the respondent's perceived knowledge of agriculture at the time of applying to veterinary college; 2) whether her or his career had been guided more by *"personal gain and reward"* or *"a sense of responsibility to society and/or the care of animals"*; and 3) the philosophical statement they identified with most: *"I work to live"* or *"I live to work."*

The remaining 14 variables were from a question that asked the respondents to *"Score the following factors in regards to how they have influenced your career path, with "1" being Not at all important and "5" being Very important."* See Table 1 for a complete listing of the statements/factors.

Table 2. Percentage of respondents who were most interested in the different veterinary career paths from the time of their preveterinary program to their current position ($n = 417$). Respondents self-classified their interest in each type of practice at each time point; no definitions were provided for what constituted a practice type

	SA	MA	FA	Equine	Other[a]
Preveterinary program	17.3	46.6	22.0	9.8	4.4
Time of graduation	24.8	48.2	16.0	7.6	3.3
2 y post-graduation	38.1	34.5	16.1	7.1	4.2
Current position[b]	50.6	21.8	13.2	6.7	7.7

SA = small animal practitioner.
MA = mixed animal practitioner.
FA = food animal practitioner.
[a] "Other" includes nontraditional veterinary practice, government positions, academia, and the pharmaceutical industry.
[b] Respondents could have been in their current position from 1–57 y.

Results

Background data

Four hundred and twenty-five veterinarians (77.1%) completed the survey, 347 (81.6%) of which were private practitioners, the remainder being in academia, government, the pharmaceutical industry and "other." Three-hundred and forty-five (345) private practitioners provided data on the amount of time they devoted to the various species and were categorized as follows: 200 (58.0%) were CA practitioners, 81 (23.5%) were MA practitioners, and 64 (18.5%) were FA practitioners.

Table 1 shows how the respondents self-classified themselves with respect to the type of practice they were most interested in over the course of their career. While interest in small animal practice increased over the 4 time points, interest in mixed practice declined over this same period.

Factors associated with career paths

Tables 3–6 show the results of the logistic regression models for the CA, MA, FA, and SW practitioners, respectively. The number of respondents used in each model was as follows: CA (n = 200), MA (n = 81), FA (n = 64), and SW (n = 83). Variables with a P-value of ≤ 0.10 were included in Tables 3–6, but only those with a P-value of < 0.05 were considered significant.

The CA practitioners were less likely to have been raised in a small center, to have graduated from the WCVM, to have perceived themselves as having been knowledgeable about agriculture at the time of applying to veterinary college, and to have identified with the *"I live to work"* philosophy. They were also less likely to have been concerned with the number of veterinarians in their practice and with their level of remuneration (wages and benefits). However, they were more likely to have been concerned with their workload (hours of work and the number of nights on-call). The CA practitioners were also twice as likely as the non-CA practitioners to have been concerned with the progressiveness of the practice in which they worked.

The factors associated with the MA practitioners were opposite to those of the CA practitioners. The MA practitioners were more likely to have been concerned with the number of veterinarians in the practice; more likely to have graduated from

Table 3. Factors associated with choosing a career in companion (small animal and equine) animal practice. Companion animal practitioners were those respondents who devoted 100% of their time to small animal and/or equine practice

					95% CI	
	β	$S_{\bar{X}}$	*P*-value	OR	Lower	Upper
Raised in a small center (≤ 10 000)	-1.149	0.302	< 0.001	0.32	0.18	0.57
Progressiveness of the practice	0.722	0.192	< 0.001	2.06	1.41	3.00
Number of veterinarians in the practice	-0.554	0.144	< 0.001	0.58	0.43	0.76
Knowledge of food animal production	-0.501	0.156	0.001	0.61	0.45	0.93
Hours of work and nights on-call	0.502	0.155	0.001	1.65	1.22	2.24
Wage and fringe benefits	-0.467	0.178	0.009	0.63	0.44	0.89
Western College of Veterinary Medicine graduate	-0.862	0.343	0.012	0.42	0.22	0.83
"Live to work" philosophy	-0.394	0.166	0.017	0.67	0.49	0.93
Type of practice	0.339	0.184	0.066	1.40	0.98	2.01
Constant	-1.671	1.251	0.181	0.19		

Nagelkerke R-square = 0.407.
Cox and Snell R-square = 0.304.
β = beta-coefficient. If the β-coefficient was > 1, as the predicator (factor) increased, the odds of the outcome occurring also increased. Conversely, if the β-coefficient was < 1, as the predictor increased, the odds of the outcome occurring decreased.
$S_{\bar{X}}$ = standard error of the mean.
OR = odds ratio is reported as exp(β) and is the natural log base (e) to the exponent β (parameter estimate). The OR is an indicator of the change in odds resulting from a unit change in the predictor variable.
95% CI = 95% confidence interval of the odds ratio.

Table 4. Factors associated with choosing a career in mixed animal practice. Mixed animal practitioners devoted ≤ 50% of their time to food animal practice

					95% CI	
	β	$S_{\bar{X}}$	*P*-value	OR	Lower	Upper
Number of veterinarians in the practice	0.416	0.140	0.003	1.51	1.15	2.00
Raised in a small center (≤ 10 000)	0.760	0.308	0.014	2.14	1.17	3.91
Type of practice	-0.368	0.175	0.035	0.69	0.49	0.98
Western College of Veterinary Medicine graduate	0.750	0.375	0.046	2.12	1.02	4.42
Progressiveness of the practice	-0.322	0.174	0.064	0.72	0.52	1.02
Constant	-0.635	1.031	0.538	0.530		

Nagelkerke R-square = 0.168.
Cox and Snell R-square = 0.112.
β = beta-coefficient. If the β-coefficient was > 1, as the predicator (factor) increased, the odds of the outcome occurring also increased. Conversely, if the β-coefficient was < 1, as the predictor increased, the odds of the outcome occurring decreased.
$S_{\bar{X}}$ = standard error of the mean.
OR = odds ratio is reported as exp(β) and is the natural log base (e) to the exponent β (parameter estimate). The OR is an indicator of the change in odds resulting from a unit change in the predictor variable.
95% CI = 95% confidence interval of the odds ratio.

the WCVM; and more likely to have been raised in, or near, a small center. They were also less likely to have been concerned with the type of practice they were involved with and with its level of progressiveness.

The FA practitioners had a number of factors in common with the MA practitioners. Specifically, they too were less likely to have been concerned with the progressiveness of the practice, more likely to have been raised in a small center, and more interested in the number of veterinarians in the practice. In addition, they were more likely to have been males; to have been raised in Saskatchewan (the western province with the highest percentage of rural inhabitants); and to have perceived their knowledge of agriculture, at the time of applying to veterinary college, as above average. Unlike the CA practitioners, they were more likely to have identified with the *"I live to work"* philosophy. Food animal practitioners were also less likely to have been concerned with hours of work and number of nights on-call.

Factors associated with the switchers

Eight-three respondents left MA or FA practice within 5 y of graduation. This group was compared with 113 veterinarians who had remained in MA or FA practice. A breakdown of the SW by their initial job (self-classified) showed that 3 had been in CA practice, 49 in MA practice, and 26 in FA practice; 4 had been in academia as MA practitioners, and 1 indicated that her or his 1st place of employment had been with the government.

The SW practitioners were less likely to have identified with the *"I work to live"* philosophy, less likely to have been WCVM graduates, more likely to have assessed their knowledge of agriculture at the time of entry in veterinary college as low, and more likely to have been concerned with the progressiveness of the practice.

Table 7 is a summary of how the SW ranked 12 statements/factors as to their level of influence when deciding on leaving MA or FA practice. Number of hours worked and the number of nights on-call was the most important determinant when it came to leaving MA or FA practice, followed by the level of remuneration, and a lack of support and mentorship.

Discussion

Practitioners either self-classified themselves by practice type or were classified according to amount of time they devoted to each

Table 5. Factors associated with choosing a career in food animal practice. Food animal practitioners were those respondents who devoted > 50% of their time to food animal practice

					95% CI	
	β	$S_{\bar{X}}$	*P*-value	OR	Lower	Upper
Being a male	1.307	0.407	0.001	3.69	1.67	8.20
"Live to work" philosophy	0.603	0.197	0.002	1.83	1.24	2.69
Raised in Saskatchewan	1.079	0.395	0.006	2.94	1.36	6.37
Knowledge of food animal production	0.477	0.197	0.016	1.61	1.10	2.37
Progressiveness of the practice	-0.452	0.204	0.027	0.64	0.43	0.95
Hours of work and nights on-call	-0.329	0.159	0.039	0.72	0.53	0.98
Raised in a small center (≤ 10 000)	0.720	0.377	0.056	2.06	0.98	4.30
Number of veterinarians in the practice	0.290	0.168	0.084	1.34	0.96	1.86
Constant	-0.202	1.354	0.881	0.82		

Nagelkerke R-square = 0.361.
Cox and Snell R-square = 0.226.
β = beta-coefficient. If the β-coefficient was > 1, as the predicator (factor) increased, the odds of the outcome occurring also increased. Conversely, if the β-coefficient was < 1, as the predictor increased, the odds of the outcome occurring decreased.
$S_{\bar{X}}$ = standard error of the mean.
OR = odds ratio is reported as exp(β) and is the natural log base (e) to the exponent β (parameter estimate). The OR is an indicator of the change in odds resulting from a unit change in the predictor variable.
95% CI = 95% confidence interval of the odds ratio.

Table 6. Factors associated with those who began a career in mixed or food animal practice but were currently in companion animal practice, the "switchers." The switchers had to self-classify themselves as to whether they had begun their careers in mixed or food animal practice and had left this type of practice within 5 y of graduation

					95% CI	
	β	$S_{\bar{X}}$	*P*-value	OR	Lower	Upper
"Live to work" philosophy	-0.562	0.192	0.003	0.57	0.39	0.83
Knowledge of agriculture	-0.544	0.191	0.004	0.58	0.40	0.84
Progressiveness of the practice	0.552	0.210	0.008	1.74	1.15	2.62
Western College of Veterinary Medicine graduate	-0.894	0.390	0.022	0.41	0.19	0.88
Number of veterinarians in the practice	-0.290	0.161	0.072	0.75	0.55	1.03
Constant	1.752	1.030	0.089	5.77		

Nagelkerke R-square = 0.209.
Cox and Snell R-square = 0.155.
β = beta-coefficient. If the β-coefficient was > 1, as the predicator (factor) increased, the odds of the outcome occurring also increased. Conversely, if the β-coefficient was < 1, as the predictor increased, the odds of the outcome occurring decreased.
$S_{\bar{X}}$ = standard error of the mean.
OR = odds ratio is reported as exp(β) and is the natural log base (e) to the exponent β (parameter estimate). The OR is an indicator of the change in odds resulting from a unit change in the predictor variable.
95% CI = 95% confidence interval.

species. In the 1st instance, the self-classification scheme was used to provide an overview of how the respondents' career paths had changed from the time of entry into veterinary college to the time of the survey. While not all of the practitioners would have used the same criteria to self-classify themselves according to practice type, this should not detract from the overriding finding that considerable career path switching occurred in the postgraduate period, notably in the movement of practitioners from MA to CA practice (Table 2).

The finding that a large percentage of the MA practitioners had moved into CA practice was not unique to this study. In another Canadian study (4), it was found that 50% of practitioners had left MA and FA practice within 5 y of graduation. Heath (8,9) conducted a longitudinal study on a cohort of Australian graduates and reported that 61% of respondents entered MA practice, but only 26% of all respondents remained in MA practice after 5 y, and only 18% after 10 y. While gender was unrelated to who entered and exited MA practice, those with a farm background were twice as likely as their urban-raised colleagues to continue working with food animals, an association that has also been reported by American researchers (10,11) and is consistent with the findings of this study.

It is noteworthy that the 4 factors associated with being a SW were also in the CA model. It appears as though a subpopulation of CA practitioners, who were unsure of their career path at the time of their graduation, began their careers in MA practice. We can assume that, over time, certain environmental factors (workload, progressiveness of the practice, etc.) encouraged the SW to move into CA practice.

While the SW ranked lack of support and mentorship as the 3rd most important reason for leaving MA or FA practice, this factor was not identified in the logistic regression model for the SW. This is probably because providing adequate support and mentorship is a critical factor for retaining practitioners in all types of practice and particularly important for retaining new graduates. Heath (12) found that a lack of support for new graduates contributed to an increase in work-related stress. Researchers in the United Kingdom also identified mentorship as a critical component for retaining new graduates and they developed a model, "the spiral of disillusionment," to explain how a cascade of events relating to poor mentorship leads to a

Table 7. Ranking of factors that were associated with 83 veterinarians (the "switchers") choosing to leave mixed or food animal practice within 5 y of graduation, where "1" was Not at all important and "5" was Very Important[a]. The factors were sorted according to the combined number of "4th" and "5th" place rankings

	1	2	3	4	5
Hours of work and number nights on-call	6	6	9	20	39
Level of remuneration	19	12	11	22	16
Lack of support and mentorship	19	9	14	14	21
Geographical location of the practice	27	11	10	13	19
Disillusioned by this type of practice	22	12	10	22	11
Left because of family considerations	30	9	8	13	16
Level of responsibilities and caseload	21	13	19	15	11
Size of city/town where clinic was located	29	13	13	17	9
Injury or risk of injury	28	17	10	12	12
Just needed a change of pace	38	5	10	13	9
Too physically demanding	32	13	15	15	6
Clientele	41	5	14	7	10

[a] Not every respondent provided data for every statement, hence the totals in each row may not add up to $n = 83$.

loss of rural practitioners (13). While many practices may be unable to decrease their workload, there is an equal opportunity for all employers to hone their mentorship skills.

Employers need to offer a competitive wage, but they should not place too much emphasis on wages and benefits. The CA practitioners were less likely than the MA and FA practitioners to have been concerned with wages and fringe benefits, but this factor was not identified in either the MA or the FA models. A central tenet of labor economics is that employees seek to maximize their utility (happiness), not their income (14). That having been said, "compensating wage differentials" can be used to entice employees to work in less than ideal working conditions, or, in the words of Adam Smith, "Wages of labour vary with the ease or hardship, the cleanliness or dirtiness, the honourableness or dishonourableness of the employment" (15).

More important than wages was the need for a proper work-life balance, a common theme that emerged from all the models, but was particularly true of the SW, who identified workload as being the main determinant for leaving MA or FA practice. This finding has also been identified by others: Heath (16) reported that the most important factors associated with practitioners leaving practice for another veterinary field were a desire for a more regular and shorter work week, fewer after-hours work, inadequate remuneration, and the attitudes of bosses. Similarly, practitioners in the United Kingdom stressed the need for better work-life balance, better pay/benefits, and progress in tackling on-call issues (17). A more recent study undertaken in the United States by the Food Supply Veterinary Medicine coalition found that the need for a more balanced lifestyle was the main determinant for veterinarians to leave FA practice (18). While there may be some debate regarding the existence or severity of the shortage of MA and FA practitioners, there should be little debate as to why the veterinarians leave practice — too many hours and too many nights on-call.

Underpinning the entire discussion relating to a proper work-life balance was the question on work philosophy — *"I live to work"* or *"I work to live."* In this study, the FA practitioners espoused the *"I live to work"* lifestyle philosophy, whereas the CA and SW practitioners were less likely to have identified with this philosophy, meaning they were more likely to have identified with *"I work to live."* Significantly, the *"I live to work"* philosophy has been linked to the older "baby boomer" generation (19). Perhaps some of the friction in employer-employee relationships stems from a generational gap, an issue that has been reported in other professions (20,21). Paradoxically, the FA practitioners were less concerned with the workload but more concerned than their non-FA counterparts with the number of veterinarians/practice, while the CA were just the opposite. We suspect that the MA and FA practitioners accept that their workload is seasonal and involves long hours and many nights on-call, hence one strategy for mitigating the workload is to join a multi-person practice where after-hours calls can be shared. The CA practitioners, on the other-hand, were more likely to be working in larger centers where they could refer their after-hours calls to emergency clinics, thereby controlling after-hours calls without having to work in a multiperson practice. Because FA practitioners may be more concerned with the number of veterinarians in the practice, this could place the 1 and 2-person practices at a disadvantage when it comes to attracting new associates. Therefore, owners of smaller practices may perceive that there is a shortage of veterinarians, a sentiment that may not be shared by the owners of the larger multiperson practices.

Three of the logistic regression models (CA, MA, and FA) relied upon classifying practitioners according to the amount of time they spent on each species. The cut-points were arbitrary, and the most difficult group to classify was the MA practitioners. It was significant, however, that even though 43.2% of the MA practitioners devoted $\leq$ 10% of their time to food animals (6), they shared more factors in common with the FA practitioners than with the CA practitioners. This suggests that practitioners who are involved in even a small percentage of MA practice differ from those who are exclusively CA practitioners.

This study identified a constellation of factors associated with the 4 different career paths. Furthermore, it confirmed what many others have already reported, if the veterinary profession truly believes that there is a shortage of MA and FA practitioners, it must address the issue of retention. The following statement captures the issue at hand, "…there is no shortage of food animal practitioners *per se,* but there is a shortage of veterinarians who would be satisfied with a traditional food animal career" (22). The profession has recognized for decades that the loss of MA and FA practitioners is a workload and lifestyle issue; yet, it has resisted changing the veterinary service model. A failure on the part of MA and FA practice to evolve will result in a future that looks much like the past, with the same lifestyle issues being recycled over and over again.

Authors' contributions

Drs. Jelinski and Campbell were responsible for the overall project, including the design and administration of the survey, the analyses of the data, and writing the manuscript. Dr. Naylor instigated the research, secured the funding, and provided input to the final version of the manuscript. Dr. Lawson and Ms. Derkzen designed and administered the Delphi survey, and were involved with the preparation of the manuscript.

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